



**California Energy
Commission**

Energy Storage Workshop

December 1, 2014

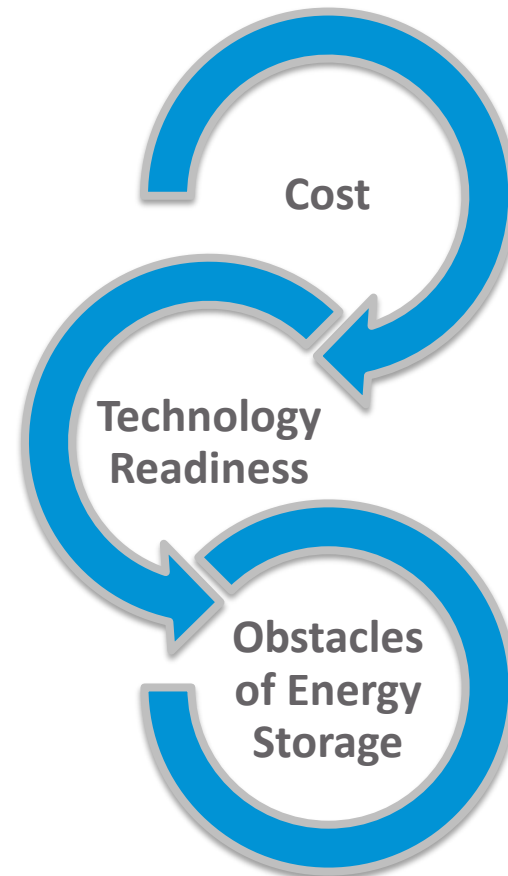
SDG&E's Energy Storage Overview



Energy Storage Overview

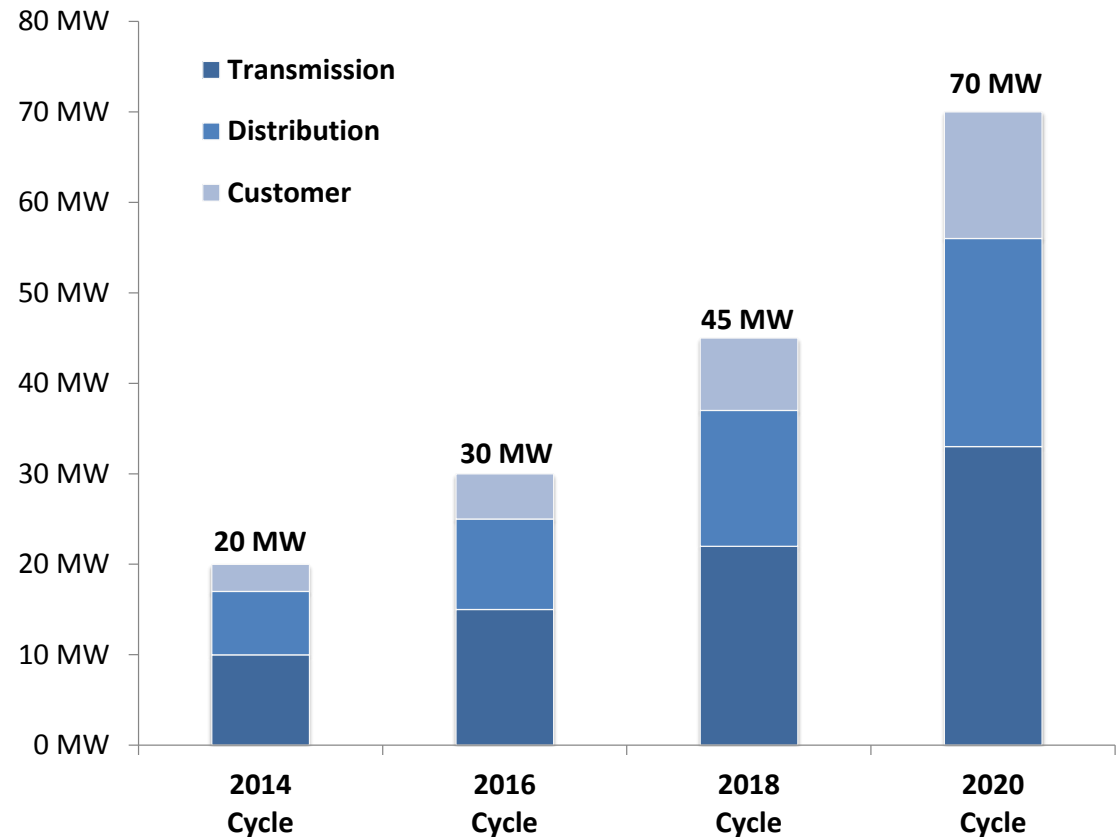
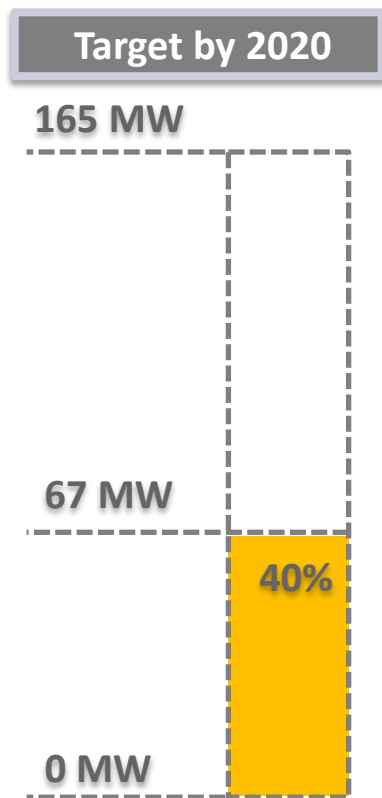
Benefits of Energy Storage

- Provide reliability and power quality services to the distribution and transmission grids
- Provide new flexible capacity resources to the system
- Allows integration of intermittent distributed and centralized renewable resources on a safe and reliable way
- Provide demand-side solutions for customers



Energy Storage Procurement Targets

SDG&E has achieved **40%** towards the **165 MW** procurement target based on approved new capacity in the 2014 cycle (**16MW**) and existing/in-progress projects (**51MW**)



2014 Energy Storage Procurement Cycle

Summary of Existing Storage Deployment 2014 Biennial Energy Storage Procurement Program

Transmission Domain

Lake Hodges Pumped Hydro PPA	Existing	40.00 MW
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Distribution Domain

Borrego Springs Microgrid	Existing	0.57 MW
2012 GRC Energy Storage Program	Existing / In Progress	<u>5.58 MW</u>
		6.15 MW

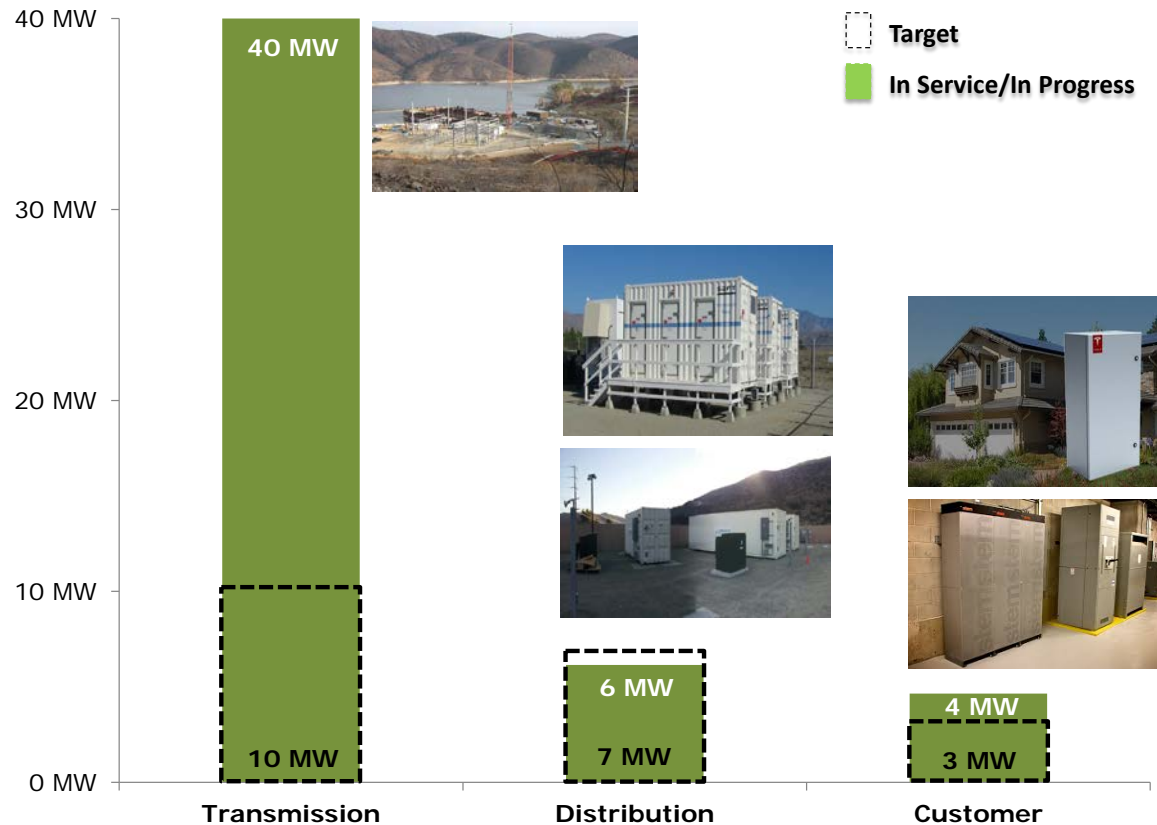
Customer Domain

Self-Generation Incentive Program	Expected	3.66 MW
Permanent Load Shifting	Expected	<u>1.00 MW</u>
		4.66 MW

All Domains		50.81 MW
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2014 Energy Storage Procurement Cycle

SDG&E has already met its 2014 procurement targets in total but would like to procure more energy storage in the upcoming solicitations of the 2014 cycle



2014 Energy Storage Procurement Cycle

Implementation of 2014 Energy Storage Procurement Plan

Track 1

2014 All Source RFO

- RFO issued on September 5, 2014 as part of Track 4 LTPP requirements
- Capacity: 25-800 MW. Includes the 12 MW approved in A.14-02-006 for Local & Flexible Capacity Requirement Programs
- Wholesale Market Participation
- 3rd Party & Utility Ownership
- Application Filing: 1Q 2016. SDG&E will seek special approval for deferred filing

Track 2

Distribution Reliability/Power Quality RFP

- RFP to be issued no later than December 1, 2014
- Capacity: 4 MW
- Distribution Reliability Use Case
- Utility Ownership only
- Application Filing: 12 months after issuance of RFP

2014 All-Source RFO - Energy Storage

Option 1

Power Purchase Tolling Agreements (ESSPPTA)

- Third Party Contracted
- Size: 500 kW – 800 MW
- Local RA Requirements
 - 4 Hours, 3 Consecutive Days.
 - San Diego Local Sub-Area
- Bids Due on Jan 5, 2015

Option 2

Turn-key Build, Own, Transfer (ESSBOT)

- Utility-Owned
- Size: 10 – 787.5 MW
- Local RA Requirements
 - 4 Hours, 3 Consecutive Days.
 - San Diego Local Sub-Area
- Notice of Interest Closed on Oct 17, 2014
- Bids Due on Jan 5, 2015

Option 3

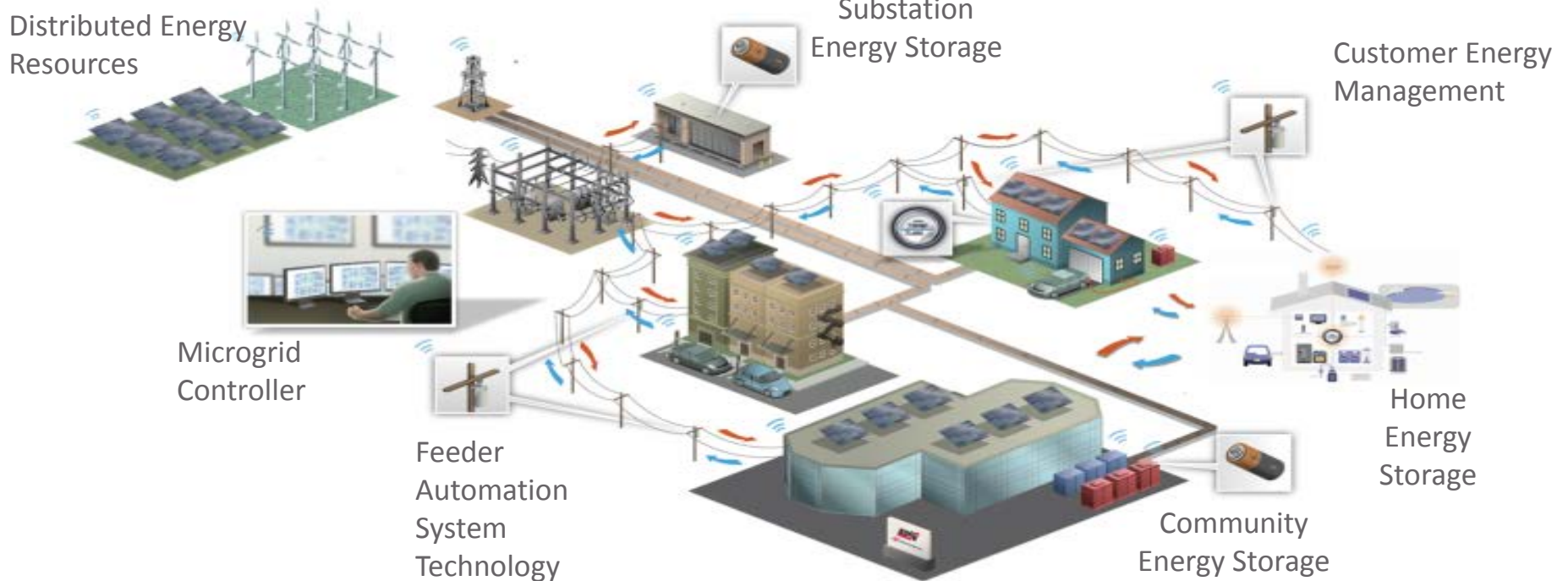
Turn-Key Engineering, Procurement & Construction (ESSEPC)

- Utility-Owned
- Size: 10 – 787.5 MW
- Local RA Requirements
 - 4 Hours, 3 Consecutive Days.
 - San Diego Local Sub-Area
- Notice of Interest Closed on Oct 1, 2014
- Bids Due on Jan 5, 2015

Borrego Springs Demonstration Project

Utilize advanced technologies to integrate and manage distributed resources within the Smart Grid

Budget:	\$8.0M DOE and \$2.8M CEC plus matching funds from SDG&E and partners
Benefits:	<ul style="list-style-type: none">■ Integrate and leverage various generation and storage configurations■ Reduce the peak load of feeders and enhance system reliability■ Enable customers to become more active participants in managing their energy use



Borrego Springs Demonstration Project

Substation Energy Storage

- One 500 kW/1500 kWh battery at Borrego Sub
- Modes of Operation
 - Peak Shaving/Load Following
 - Renewable Smoothing
 - Support Islanding Operation



Borrego Springs Demonstration Project

Lesson Learned

- Plan plan plan test test test
- Don't underestimate the complexities of integration
- Nascent technology will delay implementation
- “partner” vendors are essential when dealing with nascent technology
- Early involvement and education of all impacted organizations is important
- No substitute for field demonstrations
- Siting equipment and permitting are challenging
- DER, if done correctly, can have a very positive impact on the grid
- Can no longer have IT & Engineering silos...need blended skills & to work closely together



Acknowledgements

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